INSTRUCTION MANUAL
FOR
MODEL TTS 67C
TRACING TONE
OSCILLATOR

NORTHEAST ELECTRONICS CORPORATION

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MODEL TTS 67C

TRACING TONE OSCILLATOR

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Figure 1 Front Panel

Figure 2 Schematic

Figure 3 Board Layout

Table of Replaceable Parts

List of Manufacturer Code Letters for
Table of Replaceable Parts

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+
−
BATT TEST
310
POWER & OUTPUT
MODEL TTS-67C
TRACING TONE OSCILLATOR
LO-Z
CABLE PAIR
HI-Z
NEC
NORTHEAST ELECTRONICS CORP.
CONCORD, N.H., U.S.A.
310
T=NEG
S=POS
48 VOLT INPUT

FIG 1

MODEL TTS 67C
TRACING TONE OSCILLATOR

Operating Instructions

1.0 GENERAL

1.01 The TTS 67C is a compact unit which delivers a pulsed tone suitable for pair identification and certain types of fault location.

1.02 Its output signal is matched to the TTS 47 Search Amplifier which is recommended to trace and locate the signal.

1.03 The unit provides an easily identifiable pulsed signal at around 1/2 seconds on and 60 msec. off.

1.04 The tone is approximately 2100 cps.

1.05 Two types of impedances are available for either shorted or open pairs

1.06 The unit operates on either internal batteries or external 48 volts DC. Battery tests jacks are supplied to monitor the condition of the internal battery's life if in excess of 100 hours.

1.07 The set is housed in a rugged aluminum case, measures 8 3/4 inches, and weighs 2 pounds.

1.08 A carrying strap is provided.

2.0 PERFORMANCE

2.01 Output Level Hi Z 15 volts
Lo Z 2 volts

2.02 Output Frequency 2100 cps ±100 cps

2.03 Pulse rate approximately 1/2 seconds on 60 msec. off.

2.04 Power - 4 type 226 required
Life 100 hours
48 volts external DC 40 ma

2.05 Output is balanced on Hi Z unbalanced on Lo Z . Both are DC blocked for 50V DC.

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3.0 CONTROLS AND TERMINALS

3.01 POWER and OUTPUT - accepts a type 310 plug for connection of output signal to tip and ring. Sleeve is grounded. In Lo Z, ring is AC ground. Power is turned on to the circuitry when a plug is inserted.

3.02 BATT TEST - two pin jacks for monitoring the DC voltage of the internal batteries by means of an external voltage meter (not supplied).

3.03 CABLE PAIR - a two position slide switch selects the output signal to be high level into a high impedance (Hi Z), or low level (Lo Z).

3.04 48 VOLT INPUT - a jack to accept a 310 type plug for connecting external power. Tip is negative, sleeve is ground. This input is diode protected to guard against improper polarity.

4.0 OPERATION

4.01 To identify cable pairs by a probe -

(a) Normally the pair is not terminated at the far-end.

(b) Connect the two wires of the pair together.

(c) Set the TTS 67C CABLE PAIR switch to Hi Z.

(d) Connect one side of the output of the TTS 67C to the two wires of (b). Connect the other side of the TTS 67C output to ground.

(e) At the other end of the cable, a search is made by means of a probe and amplifier such as the TTS 47 Search Amplifier.

4.02 To Identify Cable Pairs with a Headset -

(a) Where the far-end of the pair can be connected to a headset, the TTS 67C can furnish an identifiable signal.

(b) At the near-end connect the TTS 67C to the two wires of the pair.

(c) Set the CABLE PAIR switch to LO Z.

(d) At the far-end the headset is connected to pairs until the signal is located.

4.03 To Locate Opens -

(a) Connect the TTS 67C to the wire which is open and ground.

(b) Set the CABLE PAIR switch to the HI Z position.

(c) Trace, by means of a Search Amplifier and probe, the Signal along the cable route. At the point of the open the signal monitored by the Search Amplifier will be reduced.

NOTE: The amount of reduction in signal will depend on many factors and may take a little experience in noting under certain conditions. Where the cable is enclosed in a metallic sheath or where the cable is buried, this method fails.

(g) T1 provides a step up to deliver 20 volts p-p into a high impedance with CABLE PAIR in HI Z. It can be used on lower impedance at reduced output voltage.

(h) The output of Q5 and Q6 goes direct to the OUTPUT jack in LO Z. This delivers about 2 volts p-p.

(i) Lo Z can be used to produce a lower level (to avoid cross-talk) or to drive impedance.

(j) Output impedances (where level can be considered down 3dB from open circuit) are approximately:

LO Z	30 ohms
HI Z	5000 ohms

(k) The output level will be equal in voltage for either position of CABLE PAIR with a load of about 800 ohms terminating the OUTPUT.

6.0 CALIBRATION AND MAINTENANCE

6.01 Battery Check

(a) To check batteries insert a DC voltmeter (20K ohms per volt 20 volts minimum full scale) into the BATT TEST jacks observing the polarities indicated.

(b) Insert a 310 plug into the OUTPUT and POWER jack to turn the unit on.

(c) If extensive tests are to be made into shorted pairs, then such a termination should be simulated at the OUTPUT jack. This is because such a termination requires more battery current which aged batteries may not be capable of delivering.

(d) Minimum battery voltage is 12 volts. Below this level the unit may not operate under all conditions and will only operate at much reduced output levels.

6.02 To Replace Batteries

(a) The set must be removed from the case.

(b) Remove the four screws in the corners of the front panel.

(c) Lift the front panel out of the case.

(d) Four batteries are mounted on the rear.

(e) These batteries are wired two in parallel, two in series, 18 volts total.

(f) Replace all batteries at a time under normal conditions. Under extraordinary conditions (such as a defective battery) replace parallel units.

(g) Battery supply is four 9 volt batteries, Eveready type 226 or equivalent.

6.03 Maintenance

(a) The schematic shows ttpical DC voltages and AC waveforms as observed on a cathode ray oscilloscope at the points indicated.

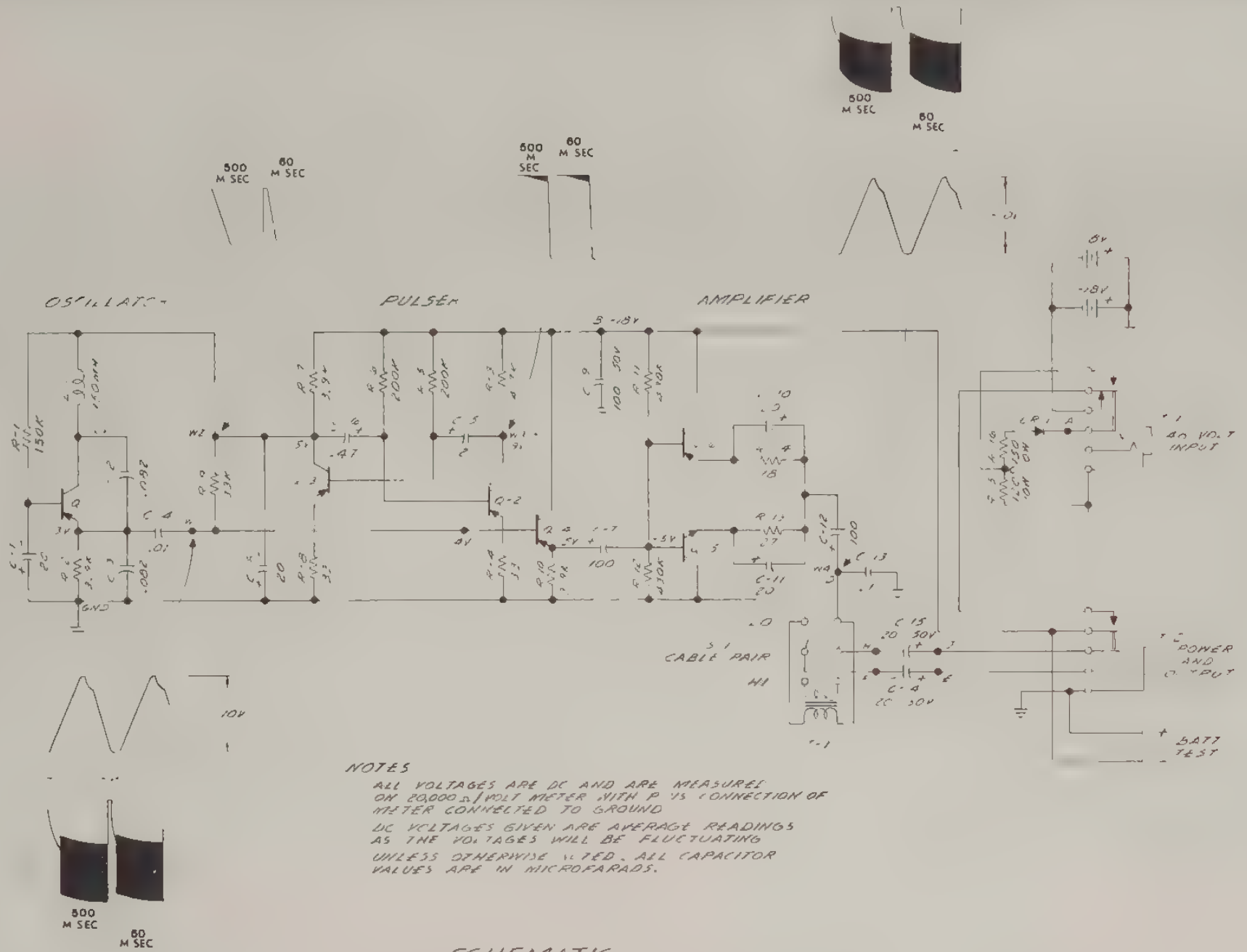
(b) No tone, but a square wave output, (1 cps), indicates possible failure in the oscillator Q1.

(c) Steady tone indicates loss of PULSER, Q2 and Q3.

(d) No tone, no square wave indicates either loss of PULSER, oscillator or amplifier.

(e) Signal tracing and comparison with typical waveforms shown on the schematic, is simplest method to isolate the trouble.

(f) DC voltages usually pinpoints the trouble.



NOTES

ALL VOLTAGES ARE DC AND ARE MEASURED ON 20,000 Ω/VOLT METER WITH P VS CONNECTION OF METER CONNECTED TO GROUND

DC VOLTAGES GIVEN ARE AVERAGE READINGS AS THE VOLTAGES WILL BE FLUCTUATING

UNLESS OTHERWISE NOTED. ALL CAPACITOR VALUES ARE IN MICROFARADS.

SCHEMATIC
MODEL TTS-67C

FIG. 2

REV. 1 11-10-65

FRONT VIEW

REAR VIEW

P.C. BOARD
LAYOUT
TTS-67C

FIG-3

TABLE OF REPLACEABLE PARTS
MODEL TTS 67C
TRACING TONE OSCILLATOR

Ref Desig.	Description	Manufacturer (FSCM Code No.)	Part Number
C1	C: 20μF, 25V	09653	APD-046
C2	C: 0.082 μF	13606	6PS-S82
C3	C: 0.082 μF	13606	6PS-S82
C4	C: 0.01μF	71590	ID-01
C5	C: 0.2μF, 15V	13606	TE-1149
C6	C: 0.47μF, 25V	13606	5C11
C7	C: 100μF, 20V	09653	APD-095
C8	C: 20μF, 25V	09653	APD-046
C9	C: 100μF, 50V	09653	APD-127
C10	C: 20μF, 25V	09653	APD-046
C11	C: 20μF, 25V	09653	APD-046
C12	C: 100μF, 20V	09653	APD-095
C13	C: 0.1μF,	71590	DDA-104
C14	C: 20μF, 50V	13606	TE-1305
C15	C: 20μF, 50V	13606	TE-1305
CR1	Diode	93332	1N2069
R1	R: 150K, ±10%, ½W	01121	
R2	R: 3.9K, ±10%, ½W	01121	
R3	R: 200K, ±10%, ½W	01121	
R4	R: 33, ±10%, ½W	01121	
R5	R: 4.7K, ±10%, ½W	01121	
R6	R: 3.9K, ±10%, ½W	01121	
R7	R: 200K, ±10%, ½W	01121	
R8	R: 33, ±10%, ½W	01121	
R9	R: 33K, ±10%, ½W	01121	
R10	R: 3.9K, ±10%, ½W	01121	
R11	R: 430K, ±10%, ½W	01121	
R12	R: 430K, ±10%, ½W	01121	
R13	R: 27, ±10%, ½W	01121	
R14	R: 18, ±10%, ½W	01121	
R15	R: 120Ω, 10W	06486	PW-10
R16	R: 150Ω, 10W	06486	PW-10
Q1	Transistor, PNP	01295	2N404
Q2	Transistor, PNP	01295	2N1374
Q3	Transistor, PNP	01295	2N1374
Q4	Transistor, PNP	01295	2N1374
Q5	Transistor, NPN	49671	2N2102
Q6	Transistor, PNP	01295	2N1374
J1	Jack	82389	55B
J2	Jack	82389	55B
L1	Coil: 150MH	81095	EA-150
S1	Switch: DPDT, Slide	83330	518
T1	Transformer	81095	TY-51X
B	Battery: -9V	25312	226

LIST OF MANUFACTURERS

MANUFACTURER	CODE NUMBER
Allen-Bradley Company	01121
Centralab	71590
Eveready	25312
International Electrical Industries	09353
International Resistance Company	06486
Radio Corporation of America	49671
Smith, Herman H	83330
Sprague Electric Company	13606
Switchcraft Inc.	82389
Sylvania Electric Company	93332
Texas Instruments, Inc.	01295
Triad Transformer	81095

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